



Simple model for assessing climatic constraints under the past and present agriculture in the northern Ethiopia

Araya Berhe (1,2), Saskia Keesstra (2), and Leo Stroosnijder (2)

(1) Mekelle University, Department of Crop and Horticultural Sciences, Mekelle, Ethiopia (arayaalemie@gmail.com), (2) Wageningen University, Land Degradation and Development Group, Wageningen, The Netherlands

Long-term climate data of four stations in the northern Ethiopia were analyzed in combination with information from local farmers and documented materials. The Z-score technique was applied to obtain drought indices from the ratio of seasonal and long-term dekad rainfall to reference evapotranspiration values. The dry and wet dekades were identified based on the drought indices. The drought seasons and the cause of the crop failures were then assessed by counting the number of wet dekades per season that correspond to the growing period. To confirm if the season was dry or wet, independent assessment was made from recorded data in the past and information was gathered from farmers. Results showed that our technique for assessing drought and crop failure ('analyzed' data) corresponded well with farmer observations ('observed'). The three major causes of crop failure (dry spells, short growing period and "total lack of rain") which were explicitly listed and ranked by the local farmers were found to match the analyzed data well. The agro-meteorological variables with the most severe consequences were "short growing period" and "total lack of rain". The conditions experienced during the famine years of the early 1980s were primarily caused by the continued total rain failure over multiple years. Generally, the technique was found to be suitable for assessing drought (crop failure) in the study area.